DOCUMENT RESUME

ED 351 378 TM 019 204

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TITLE	Using Portfolios To Assess Student Performance.
INSTITUTION	Far West Lab. for Educational Research and Development, San Francisco, Calif.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE	92
CONTRACT	RP-91002066
NOTE	9p.
PUB TYPE	Reports - Evaluative/Feasibility (142) -- Collected Works - Serials (022)
JOURNAL CIT	Knowledge Brief; n9 1992
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Educational Assessment; Educational Change; Elementary Secondary Education; *Evaluation Methods; *Portfolios (Background Materials); Scoring; *Student Evaluation
IDENTIFIERS	*Performance Based Evaluation

ABSTRACT

What educators around the country are finding out as they work with portfolios is reviewed, focusing on the classroom. Portfolios are purposeful, collaborative, self-reflective collections of student work generated during the process of instruction. Although they can be used in any academic discipline, portfolios are widely used in English and language arts and creative writing. Generally, portfolios include both work in progress and best efforts. Portfolios can: (1) function as a teaching tool and an assessment medium; (2) empower students and teachers; (3) convey to students that development matters; (4) help teachers see how students think; (5) encourage teacher-student collaboration; (6) help validate different learning approaches; (7) help prepare students for adult life; (8) promote self-assessment; (9) foster professional development; and (10) promote action research. Key steps in portfolio planning are determining goals of instruction and assessment and creating a portfolio management system. Design must consider the purpose, audience, and author. Scoring is complicated, but can be successful if criteria are clear. The problems portfolios raise appear to be more than made up for in classroom gains. Nineteen related readings and references are listed. (SLD)

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1992

NUMBER NINE

ED351378

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Using Portfolios to Assess Student Performance

Portfolios are arguably the hottest topic in student assessment today. In the movement toward measuring not what students have memorized but what they know and are able to do, it isn't hard to fathom portfolios' appeal: the concept is novel enough to draw attention yet seems familiar enough to be unforbidding. But as their popularity grows, so does the urgency to have a better understanding of what portfolios are and what they can really tell us about student learning and school effectiveness.

Most people agree that standardized tests don't tell us enough. The challenge is finding true alternatives. The 1980s' emphasis on making schools more accountable forced a nationwide re-thinking of what schools should teach and students should learn. The result is a new focus on higher order thinking and problem solving that may require many steps, teamwork, and applying knowledge from multiple subjects. But for educators this poses a dilemma: such skills cannot readily be translated into objective paper and pencil test items. So we see emerging an array of "performance-based" assessment techniques that, in turn, are prompting what one researcher calls "a return to teacher judgment after a long era where teachers taught and assessors assessed."

"Performance-based" has begun to define curriculum and instruction too, as growing numbers of teachers see assessment as an integral part of instruction, not a task they do in addition to it. "Teaching to the test," something responsible teachers have been loath to do, becomes a virtue if the test is a genuine measure of what the student has mastered and what he has yet to learn. Portfolios fit the bill as such a "test," able as they are to both guide and document the whole classroom enterprise. But how do you make something as seemingly "soft" or subjective as a portfolio yield the kind of "hard" information that teachers, states, and employers need to make decisions about grade promotion, school system change, or hiring?

We don't have all the answers yet. But this *Brief* takes a look at what people around the country are finding out as they work with portfolios. It focuses on the classroom — teacher and students — addressing larger issues to the extent possible. Particularly, it aims to share knowledge and resources with school site teams of principal(s) and teachers on a number of questions: What makes a portfolio more than just a collection of student work? How does a school launch a portfolio project? What ways are schools finding to coordinate portfolio work — within a classroom, across grades, throughout the school? Can the same portfolio meet instructional *and* "high stakes" accountability purposes? Since interpretation depends on judgment, can portfolio assessment really be reliable, consistent, and equitable?

What is a Portfolio?

Portfolios are purposeful, collaborative, self-reflective collections of student work generated during the process of instruction. Because they hold a broad repertoire of student performance over time, they can paint a rich, developmental view of learning and achievement. Suited to any academic discipline, portfolios are now used widely in English/language arts and creative writing. Their use in mathematics is increasing rapidly, and portfolios are being developed in science and other subjects.

There are no typical portfolios, since all are designed to assess a particular course or program. But they do have characteristics in common. They tend to include: a range of work over time; work assigned by the teacher and work selected by the student (the teacher specifying the type and number of pieces to include; the student choosing the pieces); an introduction in which the student explains why individual pieces were chosen; and a summary statement describing what was learned from selecting and reflecting as the portfolio was compiled. Besides products that tap paper and pencil skills, a portfolio may contain photographs, audio or video tapes, posters, even notes from parent-teacher conferences.

Generally, portfolios include both work-in-progress and best efforts. Work-in-progress focuses on instruction. It helps student, teacher,

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and parents see what the student is really learning, what skills he or she is achieving, what problems are occurring and how to overcome them. Best efforts, selected by the student in consultation with the teacher, may be the basis for a grade or may help administrators gauge whether students have met district or state standards.

As a whole, the portfolio also gives administrators a picture of course content and instructional strategies being used — information that can help guide curricular improvement or staff development.

Why Portfolios?

Those using portfolios report a number of promising findings, among them that portfolios:

- **can be designed to function simultaneously as a teaching tool and an assessment medium**. Assessment and instruction merge; nothing is tested because it is easy to measure. Instead, portfolio assessment bolsters instructional activities and judges students on the basis of performance within those activities. In mathematics, for example, students may be asked to conduct an investigation of bicycle accidents around the school. As they proceed they must pose problems as well as solve them: What statistics should be collected? Should charts or graphs use straight numbers or percents? Math skills are both honed and assessed in the context of creating the bigger (and quite meaningful) project for the portfolio.

- **empower students and teachers**. Teachers rediscover the power they have to challenge students. And students become adept at examining their own strategies and communicating their thinking to others. One high school writing teacher tells of the rationales her 11th and 12th graders wrote to accompany the "best pieces" selected from their semester's writing. They painstakingly described efforts behind a piece: long hours of trying to find better wording, examples more suited to the topic, convincing arguments and stronger support. They told of pride and pleasure in their work. "Little by little I began to feel the power this assignment had for my students and their participation in their own education. I felt as if I had been privy to their maturation, to their discovery of their own achievements."

- **convey to students that development matters, not just achievement**. By showing progress over time, portfolios allow students and teachers to see patterns of success and failure and reflect on the reasons behind them. One 12th grader tells of recognizing early in the year that to be a better writer he needed to adopt new preparation techniques: more reading and discussion of ideas with peers. Reviewing his work at mid-semester, he saw improvement. "Even though there are occasional pieces with discouraging results, the fact that I can finally write outside the boundaries of the five-paragraph essay is refreshing enough to keep my full interest and attention."

- **help teachers see how students think**. Students' written reflections about their work give teachers a window into their minds. Drew Gitomer of the Arts PROPEL portfolio project reports incorporating a journal wherein teachers enter responses to student entries. This dialogue gleans "insights about children's understanding that are not available via other classroom processes." Similarly, mathematics teachers are asking students for written explanations of strategies used to solve a problem. The teacher then sees not just an answer, but the twists and turns of logic used to get there. This may show what the student doesn't yet understand. Equally important, it can reveal how sophisticated a student's thinking really is about concepts larger than adding, subtracting, multiplying, or dividing.

- **encourage collaboration between student and teacher**. Portfolios help students evaluate how well they have learned and help teachers make instructional decisions. Both switch from thinking of assessment as something done *to* them to something they do together for mutual benefit, says researcher Sheila Valencia. Portfolios thus "strengthen the bond between student and teacher and establish them as partners in learning."

- **help validate different learning approaches**. Portfolios can offer kids the chance to think about, discuss, and show what they're learning — not just through writing, but using whatever means the teacher and student agree makes sense, e.g., teacher observation notes, tapes of the student's oral reports, or artwork. The student whose English is limited may include work in his or her first language. Pre-literate children can use drawings, with interpretations relayed through the teacher. For a history project, students might use a comic book or rap format to convey their own sense of the cultural or racial significance of events. Through interactions around this work, the teacher gains insight into the many and diverse ways children learn.

- **help prepare students for adult life**. Students begin to take responsibility for their own learning, to develop a self-critical capacity, and to trust their own judgments — capabili-

ties that are central to adult behavior in our society. Researcher Dennie P. Wolf cites examples: baseball pitcher Orel Hershiser keeping a journal because he cares too much about what makes him a crackerjack one day and just average the next not to keep track; a sculptor examining version after version, stalking an idea from inception to final work. Portfolios promote this moment-to-moment monitoring, Monday morning quarterbacking, and countless judgments of errors and worth.

- **help train students to assess themselves** — a central aim of education and a pre-requisite for worthwhile work. Valencia and colleagues have observed that while working collaboratively with students, teachers are modeling for these "apprentices" how an "expert" defines and uses criteria for evaluating work. Then, in self-evaluation, students determine and refine their own criteria for expertise. With time and guided practice, they grow increasingly skilled at critiquing their own work.

- **foster professional development**. Portfolios prompt teachers to reflect more deeply on their work, alone and with others. For example, researcher Ruth Mitchell tells of a junior high where teachers designed portfolios to contain student writing in all subjects. Group grading meetings became professional development sessions as teachers debated standards and exchanged teaching ideas. One discovery: English teachers saw that some of their history/social studies colleagues got livelier results because they gave more preparation for writing assignments than the English teachers had thought necessary.

- **promote action research**. Mitchell believes that every teacher involved in portfolios is doing research because the experience can't help but add to "the stock of knowledge about students and their learning processes." Wolf notes the contribution to research about teaching: In discussion with a supervisor, teachers use student portfolios to portray *their* work — to describe how they are teaching a variety of types of writing, encouraging students to engage in the several phases of the writing process, how they comment on and critique student work.

Planning and Designing Portfolios

Yet for portfolios to have such effects, it's clear that their use must be carefully planned and structured. As researchers Judith Arter and Vicki Spandel stress, "If not done well and interpreted properly, portfolios can mislead as much, if not more than, the results of fixed-choice tests."

But organizing a school-wide portfolio project is not easy. For starters, expect some resistance: portfolios are messy — more paper to manage, more "stuff" to store. Some teachers will view them as an add on rather than as part of classroom practice — especially if there is no training or support. Even with staff enthusiasm, ways to proceed are not obvious. Your purposes — instruction, accountability, or both — will influence every decision from who should be involved in the planning to how rigorous your standards and criteria must be.

The following ideas, derived from the work of Far West Laboratory's Rural Schools Assistance Program, can help.

Who are the planners?

Let's assume your school is in a state such as Arizona, which has mandated that school districts supplement multiple-choice, norm-referenced tests with performance-based assessments in reading, writing, and mathematics in 3rd, 8th, and 12th grades. One option is to use portfolios. If taking this route, districts must map out for the state just how their portfolio system will work.

In this instance your school team — like those in a number of states — is part of a centralized effort. (And many argue that the more centralized the portfolio project is, the more it promotes common conceptions across grade levels and schools about what acceptable performance looks like.) Your purposes go beyond instruction, and your planning — which may already include parents as critical stakeholders — will need to be coordinated with the district office.

One place that's developing a *two-tiered planning process* is California's La Mesa-Spring Valley School District. Focused on language arts portfolios, it relies on division of labor: a district committee handles such tasks as researching other districts' portfolio systems, distributing information about portfolios throughout the district, and arranging inservice workshops for teachers. Teams at each site are deciding on such things as categories of work to be included (e.g., types of writing commonly taught) and guidelines for student self-assessment. Both groups made recommendations about areas of the curriculum to assess and portfolio content.

Two Key Steps in Portfolio Planning:

1. **Determine goals of instruction and assessment**. Without clearly specified instructional goals, portfolios can easily become unfocused holding files for odds and ends or, worse, a place to collect more isolated skills tests.

School and district teams need to be clear on a central question:

what are your key goals of instruction? In other words, what are students expected to learn? Aligned with state curriculum frameworks, your goals should include two kinds: general (e.g., students should be able to solve problems, make decisions, take risks) and subject-specific. In reading, for example, goals might include understanding the author's message, learning new information from expository texts, summarizing plot, or exhibiting a desire to read.

Once goals are specified, you are ready to articulate the desired outcomes or *content standards* upon which your entire portfolio system will be built. What will students know and be able to do by the end of a given time frame? Answering this question, subject by subject and grade by grade, is as complex and time consuming as it is crucial. No performance can be assessed without a standard to measure it against.

To have real meaning, content standards should:

- be stated in terms of at least one cognitive process ("The student will understand . . . ") and one kind of performance ("The student will demonstrate...");
- focus on a major concept or "big idea";
- be succinct and stated in a way that's clear to students, teachers, and parents;
- be devised by classroom teachers and content specialists; and
- promote rich, complex, performance-based instructional activities and assessments.

Some states and content-area professional groups have issued standards that serve as guides to schools and districts. California's standards for career-technical student assessment and certification, developed by FWL, is one example. These include seven standards common to all program areas. The one for "interpersonal skills," for instance, states: "Students will understand key concepts in group dynamics, conflict resolution, and negotiation. They will work cooperatively, share responsibilities, accept supervision, and assume leadership roles. They will demonstrate cooperative working relationships across gender and cultural groups." The state expects local curricula to integrate these with program-area standards.

Once nailed down, standards are the starting point from which performance criteria and rating scales (or scoring rubrics) can be derived. To see how one state — Vermont — has done this in math, see the box on p. 5.

2. **Create a portfolio management system**.

After you are clear about what you value as outcomes from your portfolio project, the next step is creating a portfolio management system — a careful, systematic plan for getting there. Such a system requires mapping out the kinds of evidence to be collected and clarifying how that evidence will be scored, evaluated, or interpreted.

Your system will undoubtedly borrow from others' ideas. But as Arter and Spandel point out, it would be a great mistake to adopt one ready-made. "The most beneficial effect of designing such a system is the bringing together of staff to think through the issues of audience, purpose, content and criteria. Allowing teachers the time and support to discuss and articulate what is valued in a performance is almost the most beneficial part of the process."

Portfolios can be designed around the following three decisions:

What is the purpose? Author and audience need to be clear and in agreement about this. Why are you collecting this information? As already explained, portfolios can have many purposes — but these cannot conflict. And too many purposes for any one portfolio can be unproductive. Part and parcel with this question is a second one:

Who is the audience? Parents? District staff? State evaluators? Your statement of purpose will imply who the audience is. For example, the portfolio may be intended "to stand as a record of learning — not just a grade — to show parents." Or "to identify ways to change instruction for students"—in which case the audience would be teachers or principals. Portfolios work well when the specific persons who will view them are kept in mind.

Who is the author? The student is the *primary* author. But there may be other *contributors*, e.g., teachers or parents, who help keep and clearly document the collection of work. Authors need to create an organizing system around the work so that the audience can easily interpret it. This system may include: a table of contents; a letter of introduction explaining the organization of the portfolio; dates on all examples; a short explanation of why each selection is included; references. The broader the audience, the more organized the portfolio needs to be and the greater its volume of notations.

Implied here is a *confidentiality* issue: students need to know who is going to see this work so they can make decisions, e.g., about whether to include personal feelings. There is also the question of *stakes*. Portfolios designed only for classroom use — so that the teacher knows the kids are learning — carry low stakes. Stakes are high if the portfolio will determine, say, whether a child is promoted from 4th to 5th grade or whether the district superintendent will keep his or her job. It's perfectly acceptable for schools with low-

Applying Standards: A Math Example

How do you go from a standard to criteria to rubrics then apply these in evaluating student work? Here's one example from the state of Vermont.

In planning its Mathematics Portfolio Assessment Program, Vermont turned to standards set in 1989 by the National Council of Teachers of Mathematics. One of these, the *problem solving standard*, states: The assessment of students' ability to use mathematics in solving problems should provide evidence that they can:

- formulate problems
- apply a variety of strategies to solve problems
- solve problems
- verify and interpret results
- generalize solutions.

Vermont used this standard to isolate four key *performance criteria* and then to delineate *rating scales* for each as follows:

Criterion 1: Understanding of the task.

Rating Scale:
- Totally misunderstood
- Partially misunderstood
- Understood
- Generalized, applied, or extended

Criterion 2: How the student approached the task; the approach(es), procedure(s) and/or strategies adopted to attack the task.

Rating Scale:
- Inappropriate or unworkable approach
- Appropriate approach some of the time
- Workable approach
- Efficient or sophisticated approach

Criterion 3: Why the student made the choices along the way; the reflection, justification, analysis, rationale, verification that influenced decisions.

Rating Scale:
- No evidence of reasoned decision making
- Reasoned decision making possible
- Reasoned decision making/adjustments inferred with certainty
- Reasoned decision making/adjustments shown/explicated

Criterion 4: What findings, conclusions, observations, connections, generalizations the student reached.

Rating Scale:
- Solution without extensions
- Solution with observation
- Solution with connections or application
- Solution with synthesis, generalization, or abstraction

* * *

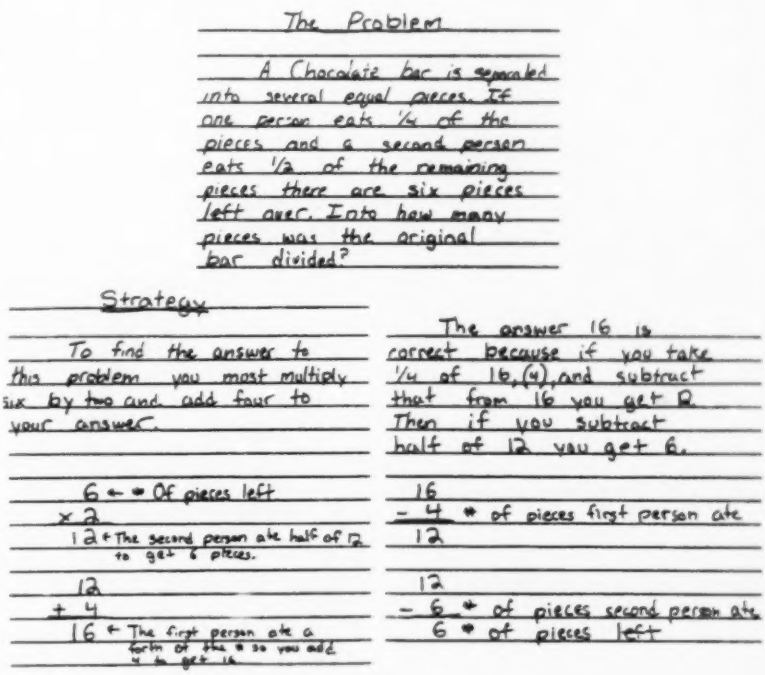
This example of an 8th grader's work (from Vermont's 1990-1991 pilot) helps explain the criteria and illustrate how they are related. Vermont's scorers rated this work as follows:

1. This student's approach to the problem and the solution give clear evidence that she understood it.

2. Her strategy was to work backwards from the six remaining pieces, doubling the amount to find out how large the candy bar was before the second person ate part of it; a good approach. Then she added four pieces to account for the one-fourth eaten by the first person; not a viable approach. Her rating, then, is "appropriate approach or procedure some of the time."

3. She provides reasons for many of her actions (e.g., the second person ate half of the 12 to get 6 pieces) and verifies her response. The reasoned decision making is, for the most part, shown or explicated.

4. She finds a solution to the problem. Even though she made a mistake, the answer is correct. There are no observations or extension, however.


The Problem
A Chocolate bar is separated into several equal pieces. If one person eats 1/4 of the pieces and a second person eats 1/2 of the remaining pieces there are six pieces left over. Into how many pieces was the original bar divided?
Strategy
To find the answer to this problem you must multiply six by two and add four to your answer.
6 ← # Of pieces left
x 2
12 ← The second person ate half of 12 to get 6 pieces.
12
+ 4
16 ← The first person ate a fourth of the # so you add 4 to get 16
The answer 16 is correct because if you take 1/4 of 16, (4), and subtract that from 16 you get 12. Then if you subtract half of 12 you get 6.
16
- 4 # of pieces first person ate
12
12
- 6 # of pieces second person ate
6 # of pieces left

stakes purposes not to use highly technical criteria. But the higher the stakes, the greater the effort must be to ensure equity and reliability in standards, criteria, and interpretation.

These questions answered, you're ready to set criteria for the *kinds of evidence* to be collected. These criteria should be clear to all and defined in collaboration with students. They should also reflect the best current thinking about what to look for in a performance. Task development should be based on the outcomes and standards that you as a school, your district, or your state has already determined are important.

Clearly, the resultant "look" of portfolios varies widely, differing not only by subject areas covered but by guidelines set and tasks included. In Juneau, Alaska, first graders are compiling language arts portfolios intended to demonstrate that they can meet the state's outcomes at a developmentally appropriate level. Included are student-selected reading samples, student- and teacher-selected writing samples, teacher anecdotal observations of speaking and listening skills, oral language cassette tapes, and drawings. California's LaMesa-Spring Valley District's purposes are similar but its project — language arts at all grade levels — distinguishes between "working folders" (warehouses containing any and all work done by students) and portfolios (selections from the working folder that are dated, anecdoted by teachers and students, shared with parents, and sent to the next year teacher).

Depending on your purposes, questions of consistency and equity across classrooms may be of particular concern. If this is true for you, Valencia suggests including two levels of evidence: 1) *required evidence* enables the audience to look systematically across students as well as at the progress of each student (i.e., you would include standardized test scores as well as an essay on a specific topic); 2) *supporting evidence* is additional documentation of learning that may be selected independently or collaboratively by the student and the teacher. These pieces may result from a spontaneous activity (e.g., a letter to an author of a favorite book) or may be carefully planned (e.g., a semantic map completed before and after reading an informational selection.)

One logistical question is important: What kind of *container* will house the portfolio? If you're including tapes, photographs, posters, and the like, manila folders will quickly give way to boxes. A number of schools are using computer-based portfolios, some including multi-media reports composed of HyperCard stacks with video, music, and simulations. A disk-based portfolio allows electronic access to all types of student assignments, self-assessments, progress forms, teacher conference notes, and parent feedback.

What gets sent to the next teacher? Arter and Spandel suggest that students may keep an instructional portfolio during the year, then at year's end extract from it a "transfer" portfolio — which may have a different purpose and audience and, thus, different guidelines.

Scoring. What criteria will be used to assess individual portfolio entries and/or the portfolio as a whole? Who develops these criteria?

Authentic tests, writes assessment specialist Grant Wiggins, measure essentials rather than easily counted (but relatively unimportant) errors. "Thus the criteria for scoring them must be equally complex." Such complexity means, for example, they cannot be scored on a curve, they must be scored with reference to standards, and they must use multi-faceted scoring systems instead of a single aggregate grade.

To create a multifaceted scoring system, your team needs to develop *scoring rubrics* based on your already agreed-upon performance criteria. A rubric is a set of guidelines for giving scores to student work. The rubric answers the question: What does mastery (and varying degrees of mastery) at this task look like?

Developing rubrics is no small task. For openers, your team needs to understand such basics as the difference between analytic and holistic scoring and decide which better suits the purposes at hand. (Analytic assesses a task by looking at specific dimensions — e.g., by reading a paper to judge for syntax, then reading it again for rhetorical effectiveness, using separate rubrics for each trait. Holistic scoring is an overall judgment of the completed product or performance that doesn't rely on specific-trait criteria.)

Typical rubrics contain a scale of possible scoring points and state major traits to be examined (e.g. "scientific method"). They also provide signs or sample traits to help scorers decide where on the scoring scale the student's work falls. Again, the level of sophistication required — as well as the degree of coordination with your district or state — is directly related to how formal your project is and what consequences it carries.

Highly technical or not, your scoring will be criterion-referenced. So your *criteria* must be clear — to scorers and especially to students. What is good performance? For what kinds of errors will points be taken off, and to what degree? How will we weigh each criterion relative to the rest? Yes, ability to describe events leading to the U.S. Civil War is more important than accurate battle dates in judging history. But what percent should we assign to each? How will we weigh "form" (such as the importance of neatness or the number of paragraphs in one's essay)? Should we overlook invented spelling? Take care to identify what you're looking for. In

writing, for example, it sometimes makes sense to look at student samples before you build the rubrics; identify the kinds of traits you saw in the high papers and what was missing from the low.

Only by carefully thinking through criteria can you send a clear (hence, fair) message to students about what quality they are expected to produce. Make your expectations explicit and public. Some teachers, for instance, post criteria on writing folders or on the classroom wall.

Unanswered Questions

Even as portfolio use gains momentum, certain issues are far from resolved. Scoring, for instance, is a central topic of debate. Should scoring lead to a grade? Contribute to a grade? Is portfolio scoring by definition too subjective? Are traditional grading systems really more objective? Large-scale portfolio assessment raises further questions. Unlike standardized tests that are scored with computer accuracy, portfolios rely on human judgment. Can we be sure, then, that scoring will be fair and consistent? Can evidence within a portfolio be varied enough to ensure that judgments are reliable?

A related problem is cost. Scoring high-stakes portfolios is labor-intensive. That alone would seem to make them and other performance-based assessments more expensive than standardized tests — and it's widely agreed that they are. True, no one ever said progress comes cheap. But are the benefits to student learning clear enough to justify major extra expense?

In fact, no one really has hard cost figures. Nationwide more than half the states require some type of performance-based assessment, with portfolios being the most popular. But only estimates of costs are available, and each state calculates these differently. Moreover, the presumed cost efficiency of standardized tests has been challenged by the Congressional Office of Technology Assessment (OTA). A recent OTA study noted that the costs reported by school districts don't include such critical variables as the dollar value of teacher time spent in test preparation and administration.

Costs aside, there is no doubt that portfolios are more time consuming and demanding than traditional assessment activities. If states mandate their use, will teachers resent the burden? Will lack of teacher commitment invalidate results? Some say yes, believing that portfolios can only succeed if the push to use them is student and teacher driven. Yet we know that in some places nothing will happen without state mandates. If we value this reform, the real issue is not top-down or bottom-up but buy-in. Teachers need to be convinced that portfolios can create real change in student learning, are manageable, can help communicate with parents and administrators, and will be viewed favorably by the community.

To make the switch to portfolio-based classrooms, teachers also need much time and support. Rural White River Elementary School in Arizona is three years into a portfolio project that is improving the entire school operation. Continued headway requires not just staff development, but time for teachers "to meditate, dream, think," says principal Myrna Hillyard. At present teachers have one day of release time a year to meet and plan — not just for portfolios but also for a host of other concerns ranging from AIDS education to foreign language curricula. Can a staff sustain its enthusiasm under such constraints?

Are Portfolios for You?

Despite unresolved questions, we know enough about portfolios to say that the problems they raise appear to be more than made up for in classroom gains. Certainly when the stakes are low, you would be well-advised to go ahead and try them out.

Beginning a portfolio project — with a few students, a classroom, or across a grade level or school — will take some doing. You'll need to educate yourselves on the many issues involved and the best thinking on each. Many helpful resources are available. But no "quick fix" model exists that will allow you to create a sophisticated project out of whole cloth. So your work will be experimental, sometimes tentative, at first uncomfortable.

Some at your school may want to wait for more "proof" before pressing forward. But though you'll be risking some staff time and energy, the gamble is worthwhile. At very least, your research will add to the pool of knowledge about teaching and learning. At best, you will give apathetic students something to care about and offer their teachers a powerful tool to spark such motivation and perhaps open new vistas for all kids.

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Resources

Arts PROPEL Project (a consortium of the Pittsburgh Public Schools, Educational Testing Service, and Project Zero of the Harvard Graduate School of Education). Contact Jo Anne Eresh, West Liberty Teacher Center, Dunster and Lamoine Streets, Pittsburgh, PA 15226, 412-571-7425.

California Assessment Collaborative. Involves Far West Laboratory and two consortia of California schools; publishes newsletter called *Assessment Matters*. Contact Andrea Whittaker, Far West Laboratory, 730 Harrison St., San Francisco, CA 94107, 415-565-3046.

California Career-Technical Student Assessment and Certification Project. Contact Stanley Rabinowitz, Far West Laboratory, 730 Harrison St., San Francisco, CA 94107, 415-565-2711.

California Science Implementation Network. Contact Kathy DiRanna, Dean's Office, School of Physical Sciences, UC Irvine, Irvine, CA 92717, 714-856-7809.

National Center for Research on Evaluation, Standards, and Student Testing. Publishes newsletter called *CRESST Line*. Contact CRESST/UCLA, 10880 Wilshire Blvd., Maxxam Bldg., Suite 700, Los Angeles, CA 90024-1522, 310-206-1532.

Vermont Assessment Program. Contact Ross Brewer, Director of Planning and Policy, Vermont Department of Education, 120 State Street, Montpelier, VT 05602, 802-828-3135.

KNOWLEDGE BRIEF

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Far West Laboratory for Educational Research and Development serves the four-state region of Arizona, California, Nevada, and Utah, working with educators at all levels to plan and carry out school improvements. The mission of FWL is to assist educators in the region by linking them with colleagues; sharing information, expertise and innovative practices; and providing technical assistance to build local capacity for continued self-improvement.

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This publication is supported by federal funds from the U.S. Department of Education, Office of Educational Research and Improvement, contract no. RP91002066. Its contents do not necessarily reflect the views or policies of the Department of Education, nor does mention of trade names, commercial products or organizations, imply endorsement. Reprinting is encouraged with proper credit.